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The Evolution of Dark Matter Halos through the Mergers of Comparable Mass Galaxies JONATHON VAN SCHELT, SUSAN LAMB, UIUC, NATHAN HEARN, Washington State University, IRINA MARINOVA, UIUC — Galactic dark matter halos are affected greatly in collisions and mergers of galaxies. In order to follow this adequately in numerical simulations, much higher resolution is required than is generally available in large-scale structure simulations. It is very important to investigate the results of collisions and mergers on individual pairs of galactic dark matter halos. We have initiated an investigation of the results of collisions between comparable mass galaxies by simulating collisions and mergers of galaxies using N-body techniques, employing between 250,000 and a million particles using the code of Hearn (2002, Ph.D Thesis, UIUC). The luminous matter will also have an effect on the eventual density distribution of the various galactic components and we include a representation of the disk and bulge. In our initial studies we simulate the merger of galaxies approaching at near escape velocity with small impact parameters that lead to slightly off-center collisions. Results show that by a time of 1.75 Gyr a central high-density region has formed in the dark matter halo with a radius of approximately 80 kpc, scaling our results to the Milky Way. Most of the dark matter remains in the region occupied by luminous matter throughout the simulation, but a small amount is spread to very large radii and would be lost to the overall potential in a cluster.

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